21. A rotary brush cutting and shredding blade for mounting to driven shaft of motorized brush cutter, comprising:

a circular disk member constituting bilateral planes and having both top and bottom sides circumscribed by a peripheral border, with serrated cutting elements disposed in a direction of rotation of said disk member for cutting and a center aperture, whereby mounting of said disk member to said driven shaft is provided, with the top side facing toward the upper continuous extent of said driven shaft and the bottom side facing away from the lower terminus of said driven shaft, for urging circular movement of said disk member in the disposed direction of rotation;

auxiliary cutting means disposed below said disk and elevated out of the planar disk body extending radially and conterminously from the direction of said center aperture and forming an unsevered angular juncture with the disk body and having three sides severed and extended radially outward of said central aperture position and radially inward of said peripheral border, said auxiliary cutting means deflected substantially axial to said planar disk body;

said auxiliary cutting means including structures having predetermined, unobstructed and even, bilateral surface configurations, whereby adherence of debris is impeded and shedding of debris is urged by centrifugal forces and manufacturing is simplified and economized and including inclined cutting edges having an orientation in longitude substantially parallel to imaginary lines drawn directly into the direction of rotation of said disk, whereby said auxiliary cutting means are

made more impact resistant and strengthened and including said auxiliary cutting means in substantial axial extension, as seen from a disk face view and also as seen from a disk edge view, whereby said auxiliary cutting means are provided with an aggressively efficient cutting and shredding capability suitable for both radial and axial modes of operation.

22. A rotary brush cutting and shredding blade as defined in claim **21** further including said auxiliary cutting means three or fewer in number, symmetrically, equiangularly and circularly disposed, whereby an inherently natural balance is achieved and whereby each of said auxiliary cutting means follows in the path of the preceding one during rapid rotation to deepen the cut and to provide enhanced shredding and whereby large openings are provided between said auxiliary cutting means to provide for unobstructed debris clearing..

23. A rotary brush cutting and shredding blade as defined in claim **21** further including said unsevered angular juncture radially inclined inward from trailing end to leading end , whereby both a raking and an enhanced shredding and debris clearing action is provided, as centrifugal forces urge debris from said leading end toward said trailing end of the angular juncture, for final ejection and whereby snagging is precluded during radial cutting.

24. A rotary brush cutting and shredding blade as defined in claim **21** further including predetermined, corresponding voids to said auxiliary cutting means, positioned radially outward of the unsevered junctures , whereby debris collection is precluded and whereby close blade nesting by vertical stacking is provided, as each said auxiliary cutting means of each said blade in a lower flat laid position can protrude upwards into said voids of each and

several blades in an upper flat laid position immediately adjacent to and above, or if positioned conversely, whereby each said auxiliary cutting means of each blade in an upper flat laid position can protrude downward into said voids of each and several blades in a lower flat laid position immediately adjacent to and below, whereby convenient nesting is provided and significant efficiencies in handling, packaging, shipping and storage are further realized.

25. A rotary brush cutting and shredding blade as defined in claim **21** further including said auxiliary cutting means having substantial, semicircular forward and rear stress relief and debris clearing apertures, and having the forward apertures substantially larger than the rear aperture, whereby a graduated, low stress blade material transitional area and bridging function is provided immediately fore and aft of said unsevered angular juncture on both upper and lower contiguous planar surfaces of the disk body, joining said elevated auxiliary cutting means structures to the disk body and whereby undue accumulation of cutting debris is prevented.

26. A rotary brush cutting and shredding blade as defined in claim **21** further including said auxiliary cutting means mountable as a separate unit, having a predetermined connecting planar structure embodiment between individual axial cutting element structures and having further a central apperture for mounting onto a separate, circular, peripherally serrated disk, whereby said auxiliary cutting means can be chosen to be of appropriate cutting aggressiveness best suited for axial cutting under a specific field conditions and whereby the radial cutting aggressiveness of the disk body separately selected, can also be optimized.

to meet the specific radial cutting requirements at hand and whereby with excessive wear or damage, a ready exchange of said auxiliary cutting means can be made and whereby a ready exchange of excessively worn said circular, peripherally serrated disk body can also be readily accomplished.

27. A rotary brush cutting and shredding blade as defined in claim **21** further including said auxiliary cutting means having serrated, largely semielliptical structures with a depressed minor axis and having extended serrations interfacing and parallel with an imaginary outermost line, whereby equalized wear is provided on said serrations, overall service life is extended and exceptionally smooth cutting in heavy brush applications is accomplished.

28. A rotary brush cutting and shredding blade as defined in claim **21** further including said auxiliary cutting means having rectangular structure, straight forward cutting edge and serrated, axially extended cutting edge, whereby excessive wear of only said forward cutting edge does not preclude effective continued service through said upper serrated cutting edge and whereby excessive wear of only said upper serrated cutting edge of said auxiliary cutting edge does not preclude continued service through said forward cutting edge of said auxiliary cutting means.

29. A rotary brush cutting and shredding blade as defined in claim **21** further including said auxiliary cutting means with unserrrated, rectangular structures with a single forward cutting edge, whereby exceptional economy of manufacture and reclaiming and exceptionally aggressive cutting and shredding specifically of grasses and weeds is accomplished.

30. A rotary brush cutting and shredding blade as defined in claim **21** further including said auxiliary cutting means and cutting edges having a substantial materials reserve at the rearward portion, whereby during use and repeated reclaiming said cutting edges are permitted to gradually and progressively be shifted and relocated into said rearward portion due to a natural service wear abrasion and due to the reclaiming removal of material and whereby this process can be repeated and the useful service life of said auxiliary cutting means is substantially extended.

31. A rotary brush cutting and shredding blade for mounting to driven shaft of motorized brush cutter, comprising:

a circular disk member constituting bilateral planes and having both top and bottom sides circumscribed by a peripheral border, with serrated cutting elements disposed in a rotational direction of said disk member for cutting and a center aperture, whereby mounting of said disk member to said driven shaft is provided, with the top side facing toward the upper continuous extend of said driven shaft and the bottom side facing away from the lower terminus of said driven shaft, for urging circular propulsion of said disk member in the disposed direction of rotation;

auxiliary cutting means disposed below said disk and elevated out of the planar disk body extending radially and conterminously from the direction of said center aperture and forming an unsevered angular juncture with the disk body and having three sides severed and extending radially outward of the center aperture position and radially inward of said peripheral border, said auxiliary cutting means deflected substantially

axial to said planar disk body;

said auxiliary cutting means including mounting means to receive individual, replaceable cutting elements of predetermined structure, whereby upon undue wear or field damage, said cutting elements can be replaced as required and whereby the service life of said circular disk member and said auxiliary cutting means can be indefinitely extended;

said auxiliary cutting means including structures having predetermined, largely unobstructed, even, bilateral configurations, whereby adherence of debris is impeded and shedding of debris is facilitated through centrifugal forces and whereby manufacturing is simplified and economized and further including cutting edges having an orientation in longitude substantially parallel to imaginary lines drawn directly into the direction of rotation of said disk, whereby said auxiliary cutting means are made more impact resistant and strengthened and including said auxiliary cutting means in substantially axial extension, as seen from a disk edge view, whereby said auxiliary cutting means are provided with an aggressively efficient cutting and shredding capability suitable for both radial and axial modes of operation.

32. The blade as defined in claim **31** further including said auxiliary cutting means three or fewer in number, symmetrically, equiangularly and circularly disposed, whereby an inherently natural balance is achieved and whereby each of said auxiliary cutting means follows largely in the path of the preceding one during rapid rotation, to deepen the cut and to provide enhanced shredding.

33. The blade as defined in claim **31** further including said unsevered angular juncture radially inclined inward from trailing end to leading end. whereby both a raking action and an enhanced cutting and debris clearing action is provided, as centrifugal forces urge debris from said leading end toward said trailing end of said unsevered angular juncture, for final ejection.

34. The blade as defined in claim **31** further including predetermined, corresponding voids, positioned radially outward of the unsevered junctures, whereby debris collection is precluded and, whereby close blade nesting by vertical stacking is provided as each said auxiliary cutting means of each said blade in a lower flat laid position can protrude upwards into the said voids of each and several blades in an upper flat laid position immediately adjacent to and above, or if positioned conversely, whereby each said auxiliary cutting means of each blade in an upper flat laid position can protrude downward into said voids of each and several blades in a lower flat laid position immediately adjacent to and below and whereby convenient nesting is provided and significant efficiencies in handling, packaging, shipping and storage are further realized.

35. The blade as defined in claim **31** further including said auxiliary cutting means having a substantial, predetermined forward and rear stress relief and debris clearing aperture, and having the forward aperture substantially larger than the rear aperture, whereby a graduated, low stress, blade materials transitional area and bridging function is provided immediately fore and aft of said unsevered angular juncture on both upper and lower contiguous planar surfaces of the disk body, joining said auxiliary cutting

means structures to the disk body and whereby undue accumulation of cutting debris is prevented.

36. The blade of claim **31** further including said auxiliary cutting means mountable as a separate unit, having a predetermined connecting planar structure embodiment between individual axial cutting element structures and having further a central aperture for mounting onto a separate, circular, peripherally serrated disk body, whereby said auxiliary cutting means can be chosen to be of an appropriate level of cutting aggressiveness most suitable for axial cutting under a given set of specific field conditions and whereby the radial aggressiveness of said circular, peripherally serrated disk body separately selected, can in turn be optimized to meet the specific radial cutting requirements at hand and whereby with excessive wear or damage, a ready exchange of said auxiliary cutting means can be made and whereby a ready exchange of similarly worn or damaged said circular, peripherally serrated disk body, can also readily be accomplished.

37. The blade as defined in claim **31** further including each said replaceable cutting element with a ramp structure integral to and immediately preceding, but somewhat recessed from the maximal axial extension of the cutting edge of said cutting element, whereby the difference in relative maximum axial projection of said cutting edge and said ramp structure serves to define the maximum cutting depth of said replaceable cutting element, thereby limiting hazardous torque or kick back cutting reactions.

Presentation of Claims of US Patent 5,875,700 Issue Date Mar. 02, 1999:

I claim:

1. A brush cutting blade for mounting to a drive shaft manipulated by a handle, said

brush cutting blade comprising:

a circular disk having a disk body defining a plane and having top and bottom sides and a peripheral edge, teeth formed on the peripheral edge and defining a direction of rotation of the disk for cutting, and a center mount for mounting the disk to the drive shaft with the top side facing the handle for rotatively driving the disk in the defined direction of rotation;

at least one cutting segment formed out of the disk body positioned radially outward of the center mount and radially inward of the peripheral edge, said segment having a generally curved triangular shape with three sides, one side being unsevered and forming a juncture with the disk body and the other sides extending from said one side radially outward of the center mount severed from the disk body, said segment deflected outwardly of the plane of the disk body toward the bottom side of the disk body at an angled orientation relative to the disk body between positions of co-planar and normal relative to the plane of the disk body and forming thereby an opening through the disk body that is radially outwardly of the juncture;

said segment having an inclined leading edge with cutting teeth on the edge for cutting in the direction of rotation and as a result of the angular orientation of the blades, said teeth presenting laterally extended cutting section from a face view and laterally extended cutting section from an edge view of the disk.

2. A brush cutting blade as defined in claim 1 wherein at least three segments are provided in said disk body, and said juncture inclined from trailing end to leading end radially inward.